Nuanced aesthetic emotions: emotion differentiation is related to knowledge of the arts and curiosity

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Abstract:

The ability to distinguish between emotions is considered indicative of well-being, but does emotion differentiation (ED) in an aesthetic context also reflect deeper and more knowledgeable aesthetic experiences? Here we examine whether positive and negative ED in response to artistic stimuli reflects higher fluency in an aesthetic domain. Particularly, we test whether knowledge of the arts and curiosity are associated with more fine-grained positive and negative aesthetic experiences. A sample of 214 people rated their positive and negative feelings in response to various artworks including positive and negative themes. Positive ED was associated with the embracing sub-trait of curiosity that reflects engagement and enjoyment of novelty and complexity, but was unrelated to artistic knowledge and perceived comprehension. Negative ED was associated with higher curiosity and particularly more knowledge of the arts. This relationship was mediated by appraised comprehension suggesting that deeper engagement with art, by those with more art knowledge, is associated with more fine-grained emotional experiences. This finding extends ED beyond well-being research and suggests that more nuanced emotional experiences are more likely for those with expertise in the arts and motivation for exploration.

Keywords: Emotion differentiation | aesthetic emotions | art knowledge | curiosity | artistic expertise

Article:

Emotion differentiation (ED) – the ability to make fine-grained distinctions between similarly valenced emotions –in the broadest sense, can be thought to reflect a certain level of mastery of one's emotions and emotional situations. Better ED is considered to reflect deep emotion knowledge that allows for adaptive responding and regulation, and has indeed been associated with greater well-being, lack of psychopathology, and more adaptive emotion regulation (Kashdan, Barrett, & McKnight, 2015; Smidt & Suvak, 2015). In this paper, we extend the

concept of ED to the realm of aesthetic engagement with works of art. Parallel to the role of ED in well-being, we propose that the tendency to make fine-grained distinctions in emotional experiences, that is, to display high levels of ED in response to art, may reflect deeper and more nuanced processing in the artistic domain.

ED has primarily been studied in the context of psychological well-being. People who differentiate between similarly valenced states are less likely to have a mental illness diagnosis, and more likely to have higher self-esteem and lower neuroticism (Barrett, Gross, Christensen, & Benvenuto, 2001; Erbas, Ceulemans, Boonen, Noens, & Kuppens, 2013; Erbas, Ceulemans, Lee Pe, Koval, & Kuppens, 2014). The underlying idea is that having differentiated and nuanced emotional responses provide individuals with more accurate and appropriate knowledge about the antecedents and consequences of their feelings and how to cope with them. Perhaps this notion that a differentiated emotional response reflects greater knowledge and understanding of a domain applies outside the realm of well-being? Here, we examine whether ED in response to artistic stimuli is related to expertise, curiosity, and comprehension in the aesthetic domain. We would like to note that by studying ED in response to artistic stimuli, we do not necessarily expect to capture the same concept as ED as it is classically measured in response to (daily) emotional events or stimuli. While some of the underlying processes could be the same or overlap, distinct processes may be involved as well. The question of whether and how these different types of ED can be distinguished is not object of this study, however.

Art is a unique and important aspect of human life that is associated with complex and diverse emotions. While psychological aesthetics has primarily been occupied with the liking versus disliking dimension (Fayn & Silvia, 2015), aesthetic emotions also include interest, awe, fascination, disgust, anger, confusion, and surprise (Silvia, 2009). Therefore, aesthetic emotions are rich and diverse, spanning both sides of the valence dimension, and differing in function from simple pleasure to meaning-making emotions such as interest. We propose that the ability to differentiate between different emotions in response to the arts should be related to more complex and nuanced aesthetic experiences. Expertise in the arts has been shown to influence aesthetic experiences in just such a way. Compared to novices, experts are more focused on stylistic, formal, and historical features (Augustin & Leder, 2006; Parsons, 1987), more interested and less confused in response to complex art (Silvia, 2013), and are more differentiated in how they think about artworks (Leder, Gerger, Dressler, & Schabmann, 2012). These findings suggest that experts experience art in ways that go beyond simply engaging with the valence of an artwork, and attend to more elements on an artwork which may facilitate deeper and more nuanced experiences. Therefore, we hypothesised that greater ED will be related to greater knowledge in the arts.

While expertise may reflect the *ability* for deep and nuanced aesthetic experiences, curiosity reflects the *motivation* to embrace and explore new experiences. Such motivation could also facilitate a more nuanced experience with art. Openness to experience (a personality domain closely related to curiosity) explained independent variance in aesthetic engagement, while controlling for knowledge of the arts (Fayn, MacCann, Tiliopoulos, & Silvia, 2015), suggesting that, regardless of expertise, curiosity is associated with greater engagement and deeper processing of art. Thus, we hypothesised that greater ED will be related to curiosity.

In line with the idea of ED being reflective of mastery of situations and emotions, we propose comprehension to be indicative of mastery in the aesthetic context. Further, we propose that such comprehension does not have to be objective, but rather an idiosyncratic appraisal of having gleaned some meaning, be it personal or otherwise, from an artwork. Given that both curiosity and knowledge of the arts are related to greater appraised comprehension of art (Silvia, 2008, 2013), we hypothesised that comprehension could facilitate greater ED.

The present research

In the present research, we investigated the correlates of positive and negative ED in response to visual art. Participants viewed and rated 18 artworks on several positive and negative emotions and rated the comprehensibility of each stimulus, along with measures of knowledge of the arts, and curiosity. We predicted that knowledge of the arts and curiosity would be associated with greater emotional differentiation, and that these relationships would be mediated by greater comprehension of the art works. To our knowledge, this is the first study to extend the concept of ED to the domain of aesthetic experience.

Method

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study.

Participants

Since this is the first paper to examine ED in the context of aesthetic appreciation, we sought a sample size of approximately 200 people which is sufficient to detect moderate effect sizes. The sample consisted of 214 students (69% female) ranging in age between 18 and 56 years ($M = 20.56$ years, $SD = 4.91$ years). Part of the sample consisted of people from various creative majors to increase the range of art knowledge within the sample. They participated in the study for either credit towards a course's research option or US$10 compensation. All participants were proficient in English.

Procedure

The data were collected in a laboratory with groups ranging from one to eight participants over a one-hour session. After providing informed consent, participants completed self-report individual difference questionnaires, and emotion and appraisal ratings of 18 visual art images (see supplementary materials for a list of artworks). The data were collected using Medialab, and the order of the images and ratings were randomised across participants. The images were in colour and broad in scope, including both traditional and contemporary art and both abstract and representational art. The set included positively and negatively themed artworks. Participants could observe the image for as long as they wanted, but for a minimum of five seconds. A smaller version of the image was visible while they reported on their thoughts and feelings.

Apart from the measures reported, personality, appraisals, and some behaviour-like preference items (e.g. I would like more information on this image) were assessed. For purposes unrelated

to the current research question, for each participant, half of the images were presented with titles, and each participant was assigned to one of four possible images-title combinations. Analyses of variance revealed no significant differences in any of the variables between the four conditions (all *ps* > .13). Analyses of covariance revealed no significant interactions between group and either expertise of curiosity in predicting negative and positive ED (all *ps* > .60) indicating that the different image-title combinations did not significantly influence relationships between ED variables and either expertise or curiosity.

Measures

Negative and positive ED. Similarly to previous studies (e.g. Erbas et al., 2013), we derived indices for ED from ratings of stimuli. Participants were asked to report on their thoughts and feelings in response to each image. It was emphasised that we were interested in their reactions, rather than how they think others would react to the images. The items were: *interesting, profound, exceptional, awe inspiring, pleasant, beautiful* for positive ED, and *disturbing, disgusting, upsetting, haunting* for negative ED. The items had a 7-point scale with endpoints of *not at all* and *yes, definitely.* The ratings have been used to measure aesthetic experiences, or have previously been proposed as possible reactions to aesthetic objects (Marković, 2012; Silvia, 2009; Silvia & Brown, 2007). Positive and negative differentiation indices were derived by calculating the within-person intraclass correlations (ICC) between the positive and negative ratings across stimuli. Two participants had negative ICCs for negative ED, which were treated as missing values for the analyses. The positive and negative intensity of the ratings were well distributed from mild to intense experiences (see supplementary materials).

Curiosity. Trait curiosity was assessed using the revised Curiosity and Exploration Inventory (CEI-II) which assesses two sub-traits of stretching and embracing (Kashdan et al., 2009). The scales are assessed through a total of 10 items on a Likert-style 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Stretching reflects seeking new experiences and information (e.g. "I actively seek as much information as I can in new situations"), while embracing reflects willingness to embrace novelty, uncertainty, and unpredictability in daily life (e.g. "I am the type of person who really enjoys the uncertainty of everyday life"). Cronbach's alpha for the embracing (.78), stretching (.78), and total (.87) curiosity scales were all acceptable.

Art expertise. Art expertise was assessed using the *aesthetic fluency scale* (Smith & Smith, 2006). The scale involves reporting on familiarity with 10 people and concepts from art history (*Mary Cassatt, Isamu Noguchi, John Singer Sargent, Alessandro Boticelli, Gian Lorenzo Bernini, Fauvism, Egyptian Funerary Stelae, Impressionism, Chinese Scrolls, Abstract Expressionism*). Participants report their knowledge on a 0 (*I have never heard of this artist or term*) to 4 (*I can talk intelligently about this artist or idea in art*) scale. The aesthetic fluency scale has been used widely to assess expertise and has displayed good internal and external validity (e.g. Silvia, 2007, 2013). Cronbach's alpha for the aesthetic fluency scale was acceptable (.84).

Comprehension. Participants reported on their comprehension in response to each artwork through one item using 7-point semantic differential scale (*comprehensible–incomprehensible*). This item has previously been used to assess the comprehension appraisal (Silvia, 2005, 2008).

Results

Both negative and positive ED were negatively skewed, so Spearman's rank was used for correlations and natural log transformation was applied to the variables for the other analyses. Negative and positive ED were reverse coded for ease of interpretation, with higher values indicating greater ED. Table 1 presents the means, standard deviations, and correlations between the variables used in the study. Large positive correlations between stretching, embracing, and total curiosity scales were observed, consistent with past work (Kashdan et al., 2009). The curiosity scales all positively correlated with art expertise, replicating past work on openness to experience (a personality domain closely related to curiosity) and aesthetic fluency (Silvia, 2007). Aggregated comprehension appraisals were positively correlated to art expertise and all curiosity scales replicating previous research (Silvia, 2008, 2013).

Table 1. Means, standard deviations, and correlations between ED and other measures.

	M	SD	1	2	3	4	5	6
1. Negative ICC	0.86	0.10						
2. Positive ICC	0.82	0.13	−.08					
3. CEI-II total	33.59	7.53	.20**	.15*				
4. CEI-II stretching	17.55	3.79	.18*	.06	.90***			
5. CEI-II embracing	16.04	4.32	.19**	.20**	.93***	.70***		
6. Aesthetic fluency	22.23	7.32	.22**	−.03	.25***	.28***	.20**	
7. Comprehension	4.54	0.73	.22**	.03	.18**	.19**	.15*	.31***

Note: Spearman rank correlations for relationships with ED.
*$p < .05$.
**$p < .01$.
***$p < .001$.

High negative ED was related to the total curiosity score as well as both sub-traits of the scale suggesting that those higher on curiosity made more fine-grained distinctions between negative emotions. Likewise, art expertise was associated with more differentiated negative emotion ratings of art. The tendency to appraise the artworks as more comprehensible, averaged across the 18 stimuli, was associated with greater negative ED, suggesting that better understanding of art is associated with a more fine-grained experience with the artwork. Higher positive ED was related to the total and embracing sub-trait of curiosity. Those higher on total and embracing curiosity scales made more fine-grained distinction between their positive emotions in response to the artworks. The relationships with positive and negative ED remained significant when controlling for overall strength of responding.[1]

Given that both curiosity and art expertise were associated with negative ED and with each other, we tested their unique effects in a regression analysis. Art expertise remained a significant predictor of greater negative ED ($\beta = .22$, $p = .002$), but curiosity was not ($\beta = .12$, $p = .09$). Thus, greater negative ED was independently associated with greater knowledge of the arts, but not curiosity. The significance of the indirect effect was assessed using bootstrapping (5000 resamples) procedure with unbiased estimators. The relationship between curiosity and negative ED was mediated by art expertise (point estimate = .035; 95% CI: .013 to .067).

We tested the mediating role of comprehension on the relationship between art expertise and negative ED in a multilevel structural equation model (MSEM; Figure 1). This is the appropriate method for modelling relationships with variables that vary at both the between- and within-person levels where the assumption of independence of observations is violated, and measurement errors are separated between the different levels of analysis (Preacher, Zyphur, & Zhang, 2010). Art expertise positively predicted both greater comprehension ($\beta = .23$, $p < .001$) and negative ED ($\beta = .19$, $p = .006$). Comprehension positively predicted negative ED ($\beta = .30$, $p = .016$). Using the Monte Carlo method (Preacher et al., 2010), the mediated path from comprehension to negative ED was significant (point estimate = .07, 95% CI: .01 to .14). Thus, comprehension mediated the relationship between art expertise and negative ED.

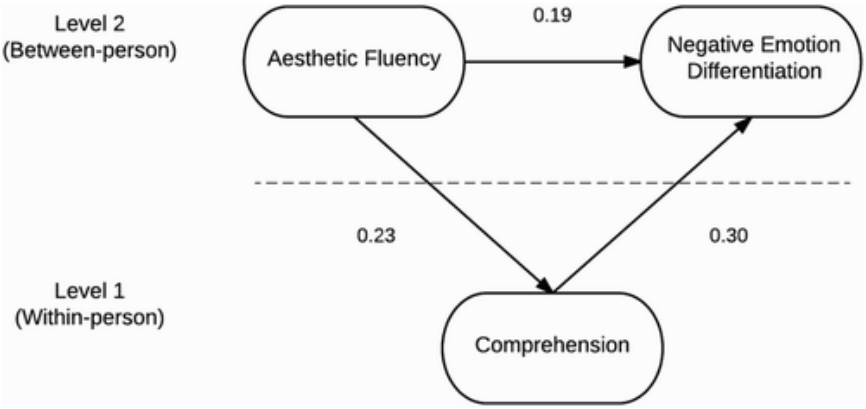

Figure 1. Multilevel structural equation mediation model.

Discussion

The current study examined positive and negative ED in response to visual art. We hypothesised that ED would be associated with knowledge of the arts, curiosity, and perceived comprehension of art. Our findings broadly supported our hypotheses. Greater knowledge of the arts and curiosity were associated with more fine-grained experience of negative emotions – an effect driven by greater knowledge rather than curiosity. An MSEM showed that this relationship was mediated by comprehension, suggesting that the more fine-grained experiences of experts could be a function of mastery. Finally, positive ED was not associated with knowledge of the arts, but was related to the embracing aspect of curiosity that reflects the willingness to embrace uncertainty and novelty. These findings extend the construct of emotional differentiation to the aesthetic context.

The association between negative ED and knowledge of the arts contributes to the literature on differences in aesthetic experience between experts and novices. Experts are more likely to like negative works of art (Leder, Gerger, Brieber, & Schwarz, 2014) suggesting a lessened valence focus, which is strongly related to ED in daily life (Erbas, Ceulemans, Koval, & Kuppens, 2015). This may explain why expertise was particularly associated to negative ED. Because experts are much more likely to like unpleasant art (e.g. in theme, style, or topic; Parsons, 1987), they are more likely to engage with the artwork thus allowing for greater comprehension and a more fine-grained distinction between negative emotions.

Positive ED was associated with the embracing aspect of curiosity – a tendency and motivation to engage with and enjoy uncertainty and unpredictability. Such a motivation may also be related to self-insight in terms of emotional states. Distinct correlates of the sub-traits of curiosity are rare (Kashdan et al., 2009), but embracing as opposed to stretching is associated with a mindfulness scale that measures the ability to observe and attend to feelings and thoughts (Kashdan et al., 2009), which is conceptually and empirically linked to positive ED (Hill & Updegraff, 2012). Contrary to prediction neither comprehension nor knowledge of the arts was associated with positive ED. This could be due to the emotion ratings used in the study, many of which load on the same dimension of aesthetic experience (Marković, 2012). Future studies should look at a broader range of emotional states.

The processes by which expertise and curiosity facilitate greater ED are at this stage speculative. While we hypothesised that comprehension facilitates greater ED, it is also possible that greater ED facilitates comprehension. Such a mediation was also significant (point estimate = .03, 95% CI: .002 to .06) and cannot be ruled out in a cross-sectional design. Other explanations for the relationships are also possible, and indeed expected considering that comprehension only partially mediated the curiosity–ED relationship. Greater ED observed in experts and the curious could be a function of greater vocabulary which would facilitate greater differentiation. Similarly, intelligence in general may have an effect on differentiation as artworks tend to be complex intellectual stimuli. Another possibility is that openness to experience, a personality domain related to both curiosity and art expertise, is driving the reported results. Openness was related to negative ED ($r = .18$, $p = .008$), but partial correlations controlling for openness did not change the significance of the results.[2] While there are no known associations between ED in daily life and expertise or curiosity, it is also possible that an underlying ability to differentiate between emotions is driving these results. This possibility should be explored in future research. Another possibility for future research to consider is that experts and curious people value art more which could facilitate more fine-grained experiences. Finally, while the instructions called for participants to report on their feelings in response to the artworks, the scales could be interpreted as ratings of properties of the artworks. Such ratings are commonly used in aesthetic research as aesthetic emotions are considered to be subject–object relationships. Future research should investigate whether changing these ratings to more traditional ways of measuring emotions would change the results.

In conclusion, we sought to extend the ED concept to an aesthetic context. Our findings suggest that ED is also relevant in this context. Differentiating negative emotions in response to the arts was associated with mastery and expertise in that context – in terms of comprehension and knowledge of the arts. Positive ED was related to the tendency to embrace novelty and complexity – the embracing sub-trait of curiosity. Our findings extend ED to the field of artistic engagement and provide an insight into nuanced emotional experiences with visual art. Indeed, aesthetic emotions have been proposed to facilitate meaning-making and mastery of complexity (Schoeller & Perlovsky, 2016), which could be studied from the perspective of ED. The study of emotions in the context of education is another emerging field (Pekrun & Linnenbrink-Garcia, 2014) where the ED perspective could be informative.

Notes

1. When controlling for overall positive affect, the partial Spearman rank correlation between positive ED and the embracing sub-trait of curiosity remained significant ($r_s = .20$, $p = .004$). When controlling for overall negative affect, the partial Spearman rank correlation between negative ED and art expertise remained significant ($r_s = .23$, $p = .001$).

2. When controlling for openness, the partial Spearman rank correlation between positive ED and the embracing sub-trait of curiosity remained significant ($r_s = .24$, $p = .0004$). When controlling for openness, the partial Spearman rank correlation between negative ED and art expertise remained significant ($r_s = .14$, $p = .045$).

Disclosure statement

No potential conflict of interest was reported by the authors.

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Supplementary materials

Supplementary table 1.

Averages, minimums and maximums of the averaged positive and negative ratings

	Average Negative Emotions				Average Positive Emotions			
	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD
Heav IV - Francis Bacon	1.25	7	4.19	1.25	1.33	7	3.73	1.21
Ancient of days - William Blake	1	5.75	1.96	1.05	1	7	4.57	1.46
Appology - Mark Ryden	1	6.5	2.78	1.31	1	7	4.59	1.36
Blue poles - Jackson Pollock	1	5.75	1.63	0.93	1	7	3.74	1.73
Buddha - Maya Hayuk	1	6.75	1.67	1.05	1	7	4.79	1.46
Echo of scream - David Alfaro	1	7	5.04	1.44	1	7	3.9	1.38
Falling stars - Anselm Kiefer	1	7	2.62	1.34	1	7	4.76	1.36
Fighter - Egon Schiele	1	7	3.27	1.63	1	7	3.52	1.44
I am born - Aya Kato	1	7	2.28	1.24	1	7	4.58	1.4
Paradice on earth - Aya Kato	1	7	1.79	1.03	1	7	4.36	1.36
Portrait of the bourgeoisie - David Alfaro	1	7	3.19	1.68	1	7	3.9	1.48
Saturn devouring his son - Francisco Goya	1	7	5.63	1.27	1	7	3.34	1.41
Sequence of Thoughts - Brendan Monroe	1	4.25	1.35	0.66	1	7	4.37	1.52
The creatrix - Mark Ryden	1	6	2.39	1.29	1	7	4.28	1.48
Fate of animals - Franz Marc	1	7	2.32	1.38	1	7	4.69	1.33
The human condition - René Magritte	1	4.5	1.52	0.81	1	7	4.85	1.48
The rise of empire - JMW Turner	1	5	1.47	0.73	1.33	7	5.12	1.2
Barge haulers on the Volga - Ilya Repin	1	7	3.64	1.51	1	7	4.12	1.32
Mean			2.71	1.20			4.29	1.41
SD			1.21	0.28			0.49	0.12

Supplementary table 2.

Averaged within-person maximum ratings of each emotion item.

	Mean	SD
Exceptional	6.46	0.74
Profound	6.33	0.88
Awe inspiring	6.3	0.89
Interesting	6.85	0.41
Pleasant	6.77	0.47
Beautiful	6.67	0.55
Disgusting	5.99	1.26
Disturbing	6.47	0.85
Haunting	6.47	0.77
Upsetting	6.09	1.05